

A botanical trip to Moralkanda (Himachal Pradesh)¹

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A botanical excursion to the Moralkanda hill tract in Himachal Pradesh in the months of September and October resulted in a collection of 219 specific or infraspecific taxa of which 188 are dicotyledons, 17 monocotyledons, 5 gymnosperms and 9 pteridophytes. Moralkanda lies at 31°15' N and 77°45' E and falls outside the boundary of the area covered by Collett's (1902)⁴ FLORA SIMLENSIS. The specimens enumerated in the list are lodged in the herbarium of the National Botanic Gardens, Lucknow.

LOCATION AND TOPOGRAPHY

Moralkanda hill tract lies at 31°15' N and 77°54' E in the Rohru and Rampur Tehsils of Simla District in Himachal Pradesh. The main hill range starts from Sungri and extends to a place called Chander Nahan, the origin of the river Pabbar. This hill range forms the dividing line between the catchments of Sutlej and Pabbar rivers. Regular transport is available from Simla to Khudrala (90 km); from there onwards up to Sungri, there is a fair-weather motorable road (15 km).

The entire tract is mountainous with elevations ranging between 2100 m and 5500 m above mean sea level. However, the expanses of the slopes extend down into the valleys even to lower altitudes. The slopes are generally moderate to steep. The undulating meadows serve as good grazing pastures for sheep and goats.

Geology soil and climate:

The rocks consist of mainly gneiss and micaceous schist, often interspersed with outcrops of granite.

The soil varies from loam to sandy-loam.

The area receives a total of 100-150 cm rainfall annually. The maximum temperature remains around 10°C and minimum goes below freezing point (-5°C).

Vegetation:

When approached from Sungri, the lower hill slopes of the tract up to around 2700 m are covered with conifers like *Cedrus deodara*, *Picea smithiana*, *Pinus wallichiana*, *Abies pin-drow* and *Taxus wallichiana*. The prominent broad leaved trees are *Acer caudatum*, *Prunus cornuta* and *Rhododendron arboreum*. The noteworthy woody climbers are *Clematis connata*, *Schisandra grandiflora*, *Hedera nepalensis* and *Parthenocissus semicordata*. Among shrubs or small trees mention may be made

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⁴ COLLETT, H. (1902): Flora Simlensis (second impression 1921). London.

of *Norysca urala*, *Coriaria nepalensis*, *Desmodium tiliaefolium*, *Indigofera heterantha*, *Prinsepia utilis*, *Rubus* sp., *Rosa sericea*, *Spiraea lindleyana*, *S. canescens*, *Deutzia staminea*, *Lonicera obovata*, *Viburnum mullaha*, *Cynanchum vincetoxicum*, *Plectranthus japonicus*, *Sarcococca saligna*, *Salix elegans* and *Smilax vaginata*. The herbaceous elements as seen at the fringes of arboreal vegetation or on clearings or along with the shrubs are *Anemone rivularis*, *Delphinium vestitum*, *Thalictrum reniforme*, *Erysimum hieracifolium*, *Viola canescens*, *Lychnis fimbriata*, *Geranium wallichianum*, *Oxalis corniculata*, *Impatiens scabrida*, *Agrimonia pilosa* var. *nepalensis*, *Potentilla nepalensis*, *Astilbe rivularis*, *Bergenia ligulata*, *Sedum crassipes*, *Circaea cordata*, *C. imaicola*, *Epilobium brevifolium*, *Bupleurum falcatum*, *Pimpinella diversifolia*, *Galium molugo* ssp. *asperifolium*, *Ainsliaea aperta*, *Anaphalis busua*, *A. contorta*, *A. margaritacea* ssp. *angustior*, *Aster peduncularis* ssp. *peduncularis*, *Carpesium pubescens*, *Prenanthes brunoniana*, *Senecio chrysanthemoides*, *S. rufinervis*, *Taraxacum officinale*, *Androsace lanuginosa*, *Swertia tetragona*, *S. purpurascens*, *Cynoglossum lanceolatum*, *Pedicularis megalantha*, *Wulfenia amherstiana*, *Clinopodium vulgare*, *C. umbrosa*, *Elsholtzia patrini*, *Leonurus cardiaca*, *Nepeta elliptica*, *N. ciliaris*, *Origanum vulgare*, *Phlomis bracteosa*, *Prunella vulgaris*, *Salvia nubicola*, *Thymus serpyllum*, *Plantago erosa*, *Achyranthes bidentata*, *Cyathula capitata*, *Chenopodium album*, *Polygonum aviculare*, *P. amplexicaule* var. *speciosa*, *P. alatum*, *P. polystachyum*, *Cannabis sativa*, *Lecanthus wightii*, *Urtica parviflora*, *Epipactis latifolia*.

Reaching higher up to around 3500 m, trees and shrubs frequently met with are *Pyrus lanata*, *Betula utilis*, *Berberis lycium*, *B. chitria*, *Euonymus fimbriatus*, *Cotoneaster acuminatus*,

Rosa macrophylla, *R. sericea*, *Spiraea vestita*, *Sorbus foliolosa*, *Ribes rubrum*, *Lonicera myrtillus* var. *depressa*, *Viburnum cotinifolium*, *V. erubescens*, *Rhododendron lepidotum*, *Jasminum revolutum* and *Pteracanthus alatus*. The commoner herbs collected at higher altitudes include *Anemone obtusiloba*, *Thalictrum cultratum*, *Corydalis moorcroftiana*, *Trifolium repens*, *Sibbaldia parviflora*, *Bergenia stracheyi*, *Saxifraga diversifolia* var. *parnassifolia*, *Sedum crassipes*, *Selinum wallichianum*, *Rubia manjith*, *Valeriana hardwickii*, *Morina longifolia*, *Artemisia nilagirica*, *Erigeron multiradiatus*, *Prenanthes violaefolia*, *Scrophularia calycina*, *Verbascum thapsus*, *Nepeta govaniana*, *Prunella vulgaris*, *Stachys sericea* and *Rumex nepalensis*.

It may be noted that many of the herbs encountered at the lower altitudes continue to ascend to the higher regions whereas the ones mentioned in higher altitudinal zones may descend to lower levels. Among the most important tree elements that one encountered between 2400 m and 3500 m mention may be made of *Quercus semecarpifolia*. At around 3500 m pure formations of this species are a notable feature. At several places this species along with *Viburnum erubescens* form the last tree line. At still higher altitudes, there are green meadows where vegetation is composed of herbs or procumbent shrubs such as *Aconitum heterophyllum*, *Geranium collinum*, *Astragalus himalayanus*, *Acomastylis elata*, *Cotoneaster microphylla*, *Parnassia nubicola*, *Saxifraga diversifolia*, *Epilobium laxum*, *Bupleurum wightianum*, *Selinum vaginatum*, *Anaphalis royleana*, *Artemisia nilagirica*, *Tanacetum longifolium*, *Taraxacum officinale*, *Cyananthus lobatus*, *Pedicularis brunoniana*, *P. megalantha*, *Stachys sericea*, *Iris* sp., along with several of the species that are met with at around 3000-3500 m.

A total of 219 specific or infraspecific taxa was collected from the Moralkanda region in the months of September and October. Of these 188 were dicotyledons, 17 monocotyledons, 5 gymnosperms and 9 pteridophytes. The specimens enumerated in the list are lodged in the herbarium of National Botanic Gardens, Lucknow.

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ANGIOSPERM RANUNCULACEAE

Aconitum heterophyllum Wall. ex Royle

A perennial erect herb having dull green-blue flowers with purple veins.

3660 m. Fruiting. Frequent. *Sharma & Badola* 944.

Anemone obtusiloba D. Don

A perennial herb with white flowers or flowers tinged with blue near the base.

2810 m. Flowering, petals white inside, purple outside. Occasional. *Sharma & Badola* 894; 3355 m. Flowering, flowers white or violet. Frequent at this altitude. *Sharma & Badola* 985.

A. rivularis Buch.-Ham. ex DC.

A perennial herb with flowers white inside and bluish outside.

2745 m. Fruiting, fruit hooked. Common. *Sharma & Badola* 869.

Clematis connata DC.

A woody, climbing shrub with yellow-white flowers.

2590 m. Flowering. Frequent. *Sharma & Badola* 795.

Delphinium vestitum Wall.

An erect herb with dull blue flowers.

2745 m. Flowering. Frequent. *Sharma & Badola* 871.

Ranunculus hirtellus Royle

A perennial herb with bright yellow flowers. 3355 m. Flowering, flowers yellow. Occasional. *Sharma & Badola* 979.

Thalictrum cultratum Wall.

A perennial, glabrous herb with white flowers.

3050 m. Fruiting. Frequent. *Sharma & Badola* 934.

T. foliolosum DC.

A tall perennial herb with white-pale-green flowers.

2290 m. Fruiting, 5-6 fruits per head. Frequent at this altitude. *Sharma & Badola* 1016.

T. reniforme Wall.

A perennial herb with large leaves and greenish-white flowers.

2810 m. Fruiting. Common. *Sharma & Badola* 895.

SCHISANDRACEAE

Schisandra grandiflora Hook. f. & Thoms.

A woody, glabrous, climbing shrub with pinky-white flowers.

2745 m. Vegetative. Occasional, climbing on trees. *Sharma & Badola* 892.

BERBERIDACEAE

Berberis chitria Ham. ex Ker. (*B. umbellata* Wall. ex Hook. f. et Thomson)

An erect, straggling shrub with yellow flowers.

3200 m. Fruiting. Frequent. *Sharma & Badola* 947.

B. lycium Royle

An erect, woody, yellow shrub with pale yellow flowers.

2895 m. Fruiting. Occasional. *Sharma & Badola* 870.

FUMARIACEAE

Corydalis cornuta Royle

A procumbent, glaucous herb with yellow flowers tipped with dark purple.

2745 m. Flowering and fruiting, flowers yellow, tongue dark purple. Occasional. *Sharma & Badola* 887.

C. moorcroftiana Wall. ex Hook. f. & T.

A herb with woody root stock and flowers yellow with purple tips.

3395 m. Flowering and fruiting, flowers yellow, tongue dark violet. Frequent at this altitude at moist places. *Sharma & Badola* 981.

BRASSICACEAE (CRUCIFERAE)

Capsella bursa-pastoris (Linn.) Medic.

An erect, annual herb covered with branched hairs; flowers small, white.

3050 m. Flowering and fruiting, flowers white. Occasional. *Sharma & Badola* 933.

Erysimum hieracifolium Linn.

A perennial herb, covered with short, adpressed, forked, stellate and simple, hairs; flowers orange-yellow.

2745 m. Flowering and fruiting, flowers yellow. Frequent. *Sharma & Badola* 873.

VIOLACEAE

Viola canescens Wall.

A softly pubescent herb with lilac flowers.

2590 m. Flowering and fruiting, flowers bluish or pinkish. *Sharma & Badola* 814.

V. inconspicua Blume (*V. patrinii* DC.)

A glabrous or pubescent herb with dark lilac flowers.

2895 m. In bud. Rare. *Sharma & Badola* 877.

CARYOPHYLLACEAE

Lychnis fimbriata Wall. ex Benth. (*L. indica* Benth. var. *fimbriata* (Wall. ex Benth.) Edgew. & Hk. f.

A tall dichotomously branched, perennial, pubescent herb with purple or cream-white flowers.

2590 m. Flowering and fruiting. Flowers cream coloured with bluish-tinge. Frequent. *Sharma & Badola* 810.

HYPERICACEAE

Hypericum elodeoides Choisy

A perennial herb with yellow flowers.

2745 m. Flowering and fruiting, flowers yellow. Occasional. *Sharma & Badola* 927.

Norysca urala (Hamilt.) K. Koch (*Hypericum patulum* Thunb.)

A glabrous shrub with yellow flowers.

2590 m. Fruiting, small shrub on dry rocks. *Sharma & Badola* 812.

GERANIACEAE

Geranium collinum Steph. ex Willd.

9 diffuse or ascending, hoary or glandular-pubescent herb with 5-7-lobed orbicular leaves.

3660 m. Flowering, flowers purple. Common at this altitude. *Sharma & Badola* 966.

G. nepalense Sweet

A slender, much branched, diffuse, hairy herb with pale purple flowers.

2590 m. Flowering and fruiting, flowers small, pinkish or bluish with blue streaks. *Sharma & Badola 816.*

G. wallichianum D. Don ex Sweet

An erect, perennial, hairy herb with blue-purple flowers.

2590 m. Flowering, flowers blue and large. Abundant. *Sharma & Badola 845.*

OXALIDACEAE

Oxalis corniculata Linn.

A diffuse, creeping annual with yellow flowers.

2590 m. Flowering and fruiting, flowers yellow. Frequent. *Sharma & Badola 820.*

BALSAMINACEAE

Impatiens amphorata Edgew.

A glabrous, branched herb with purple flowers.

2290 m. Flowering and fruiting, flowers pinkish. Frequent. *Sharma & Badola 1003.*

I. micranthemum Edgew.

A glabrous herb with white flowers; the lip spotted with pink and yellow.

2290 m. Flowering and fruiting, flowers small, white. Frequent. *Sharma & Badola 1006.*

I. scabrida DC.

An erect, pubescent herb with golden yellow flowers.

2590 m. Flowering and fruiting, flowers yellow, large. Common. *Sharma & Badola 806.*

I. thomsoni Hook. f.

A tall, glabrous herb with pale-pink flowers. 3355 m. Flowering and fruiting, flowers blue. Occasional. *Sharma & Badola 977.*

RUTACEAE

Boenninghausenia albiflora Reichb.

A perennial, nearly glabrous herb with white flowers.

2290 m. Flowering and fruiting, flowers white. Rare. *Sharma & Badola 1015.*

CELASTRACEAE

Euonymus fimbriatus Wall.

A tree with white flowers.

2835 m. Fruiting, fruits 3-4 angular and 3-4-seeded capsule. Small tree. Occasional. *Sharma & Badola 889.*

E. tingens Wall.

A small tree with yellowish white flowers.

2290 m. Fruiting, small shrub growing on dry rock. Rare. *Sharma & Badola 1005.*

VITACEAE

Parthenocissus semicordata (Wall.) Planch.

(*Vitis himalayana* Brandis var. *semicordata* Lawson)

An extensive climbing shrub with yellow-green flowers.

2745 m. Fruiting. Frequent. *Sharma & Badola 884.*

ACERACEAE

Acer caudatum Wall.

A large tree with glaucous shoots and white flowers.

2745 m. Vegetative. Frequent. *Sharma & Badola 898.*

ANACARDIACEAE

Rhus punjabensis Stewart

A tree, with white or pale yellow-green flowers.

2135 m. Vegetative, small tree. Occasional. *Sharma & Badola 1022.*

CORIARIACEAE

Coriaria nepalensis Wall.

A large, glabrous shrub with small greenish yellow flowers.

2590 m. Vegetative. Occasional. *Sharma & Badola* 792.

FABACEAE (PAPILIONACEAE)

Astragalus himalayanus Klotzsch

A perennial herb, with lilac or purple flowers.

3660 m. Fruiting. Common, procumbent herb. *Sharma & Badola* 969.

Caragana brevispina Royle

An erect, shrub with bright yellow flowers.

2290 m. Fruiting, large shrub. Frequent. *Sharma & Badola* 1017.

Desmodium tiliacifolium G. Don

A tall erect shrub with pale pink flowers.

2590 m. Flowering. Frequent. *Sharma & Badola* 786.

Indigofera habepetala Benth.

A tall, thinly hairy or glabrous shrub with crimson-red flowers.

2290 m. Fruiting, large shrub. Frequent at this altitude. *Sharma & Badola* 1004.

I. heterantha Wall. ex Brandis (*I. gerardiana* Wall. ex Baker)

A silvery pubescent or tomentose shrub with pale red or purple flowers.

2590 m. Flowering and fruiting, flowers purple. Frequent. *Sharma & Badola* 836.

Parochetus communis Buch.-Ham. ex D. Don

A slender, creeping, hairy herb with deep violet-blue flowers.

2440 m. Flowering and fruiting, flowers blue. Slender herb, creeping on moist soil. *Sharma & Badola* 992.

Trifolium repens Linn.

A glabrous or slightly hairy, perennial herb. Flowers white or tinged with pink.

3050 m. Flowering, flowers white. Stem creeping on ground. Common. *Sharma & Badola* 847.

Vicia pallida Turez.

A tall, straggling, glabrous climber with pale lilac flowers.

2590 m. Flowering and fruiting, flowers white-purple. Creeping on rocks. Occasional. *Sharma & Badola* 809.

ROSACEAE

Acomastylis elata (Wall.) F. Bolle (*Geum elatum* Wall.)

A soft, hairy herb; root stock perennial; flowers yellow.

3660 m. Flowering and fruiting, flowers yellow, large. Common at this altitude. *Sharma & Badola* 964.

Agrimonia pilosa Ledeb. var. *nepalensis* (D. Don) Nakai (*A. eupatorium* Linn.)

A perennial, hairy herb with yellow flowers.

2590 m. Flowering and fruiting, flowers yellow. Frequent. *Sharma & Badola* 807.

Cotoneaster acuminatus Lindl.

2895 m. Fruiting. Large shrub. Frequent. *Sharma & Badola* 885.

C. affinis Lindl. var. *bacillaris* (Lindl.) Schneid.

A large slender shrub with white flowers.

2290 m. Vegetative, small tree. Frequent. *Sharma & Badola* 999.

C. microphylla Wall. ex Lindl.

A dwarf, dense, usually procumbent, much branched shrub with white flowers.

3660 m. Fruiting. Bush. Frequent. *Sharma & Badola* 958.

Geum urbanum Linn.

A softly hairy herb with pale yellow flowers.

2290 m. Fruiting. Rare. *Sharma & Badola* 997.

Potentilla arbuscula D. Don (*P. fruticosa* auct non Linn.)

An erect or prostrate herb with bright yellow flowers.

3355 m. Vegetative shrub. Occasional. *Sharma & Badola* 955.

P. nepalensis Hook. f.

A perennial herb with dark crimson flowers.

2590 m. Flowering, flowers red. Frequent. *Sharma & Badola* 791.

Prinsepia utilis Royle

A dark green, glabrous, spiny shrub with white flowers.

2590 m. Flowers in bud. Frequent. *Sharma & Badola* 817.

Prunus cornuta (Royle) Steud.

A moderate-sized tree with white flowers.

2440 m. Vegetative. Frequent. *Sharma & Badola* 995.

Pyrus lanata Don

A tree, more or less white-tomentose, with white flowers.

3050 m. Fruiting, berry many seeded, of the size of that of *Ficus glomerata*, seeds black. Fruits eaten by local people. A small tree. Frequent. *Sharma & Badola* 856.

P. pashia Buch.-Ham. ex D. Don

A small, deciduous tree, flowers white, tinged with pink.

2290 m. Vegetative. Occasional. *Sharma & Badola* 1021.

Rosa macrophylla Lindl.

An erect, prickly shrub with pink flowers.

3355 m. Fruiting, fruits large, red. Occasional. *Sharma & Badola* 937.

R. moschata Mill. ex J. Herrmann

A tall climbing, glabrous or nearly so, prickly shrub with white flowers.

2290 m. Fruiting. Occasional. *Sharma & Badola* 1001.

R. sericea Lindl.

An erect, pubescent, sometimes glandular, prickly or smooth shrub with white flowers.

2895 m. Vegetative, branches spinous or without spines. Frequent at this altitude. *Sharma & Badola* 886; 2795 m. Vegetative. Frequent. *Sharma & Badola* 903.

Rubus sp.

A prickly shrub.

2950 m. *Sharma & Badola* 794.

Sibbaldia parviflora Willd.

A small-flowered plant covered with rather stiff silky hairs.

3355 m. Fruiting. Frequent at this altitude. *Sharma & Badola* 978.

Sorbus foliolosa (Wall.) Spach (*Pyrus foliolosa* Wall.)

A shrub or small tree; leaves and inflorescence more or less covered with red-brown tomentum; flowers white or tinged with green.

3510 m. Fruiting, fruits pinkish. Small tree, leaves imparipinnate, leaflets usually 15-23. Occasional. *Sharma & Badola* 943.

Spiraea canescens D. Don

A small, stiff, softly tomentose or pubescent shrub with white or pale pink flowers.

2590 m. Fruiting. Frequent. *Sharma & Badola* 793.

S. lindleyana Wall. (*S. sorbifolia* Linn.)

A tall, nearly glabrous shrub with white flowers.

2440 m. Fruiting. Frequent at this altitude. *Sharma & Badola* 1002.

S. vestita Wall.

A shrub-like herb; root stock perennial. Flowers white.

3355 m. Fruiting. Occasional. *Sharma & Badola* 951.

SAXIFRAGACEAE

Astilbe rivularis Buch.-Ham. ex D. Don
An erect, hairy perennial herb with very small green-yellow flowers.
2810 m. Fruiting. Frequent. *Sharma & Badola* 893.

Bergenia ligulata (Wall.) Engl.
A perennial herb with thick root stock; flowers white, pink or purple.
2590 m. Vegetative. Frequent. *Sharma & Badola* 822.

B. stracheyii (Hook. f. & Thoms.) Engl.
A perennial herb with a stout woody root-stock; flowers white or rose.
3355 m. Fruiting. Common on wet rocks at this altitude. *Sharma & Badola* 976.

Parnassia nubicola Wall. ex Royle
A glabrous, perennial herb; root stock stout; flowers white.
3660 m. Fruiting. Frequent. *Sharma & Badola* 945.

Ribes rubrum Linn.
An erect, pubescent or nearly glabrous shrub with green-yellow flowers.
3050 m. Fruiting, fruits black. Frequent. *Sharma & Badola* 932.

Saxifraga diversifolia Wall. ex Sternb.
An erect herb with yellow or pale yellow flowers.
3660 m. Flowering and fruiting, flowers yellow. Frequent around this altitude. *Sharma & Badola* 980.

S. diversifolia Wall. ex Sternb. var. *parnassifolia* (D. Don) Engl.
An erect herb with yellow flowers.
3355 m. Flowering, flowers yellow. Fre-

quent at this altitude. *Sharma & Badola* 974.

HYDRANGEACEAE

Deutzia staminea R. Br. ex Wall.
An erect, stellately pubescent shrub with white flowers.
2590 m. Fruiting. Occasional. *Sharma & Badola* 832.

Philadelphus tomentosus Wall. ex Royle
(*P. coronarius* Linn.)
An erect shrub, nearly or quite glabrous with orange-white flowers.
2290 m. Fruiting. Rare. *Sharma & Badola* 1007.

CRASSULACEAE

Sedum crassipes Wall. ex Hook. f. & Thoms.
(*S. asiaticum* Cl. non DC.)
A succulent herb with yellow flowers.
3355 m. Fruiting. Occasionally abundant. *Sharma & Badola* 952.

S. linearifolium Royle (*S. trifidum* Wall.)
An erect, glabrous herb with pale pink flowers.
2745 m. Fruiting. Occasional, growing on tree trunk. *Sharma & Badola* 909.

ONAGRACEAE

Circaea cordata Royle
An erect, pubescent or hairy herb with white flowers.
2590 m. Fruiting. *Sharma & Badola* 797.

C. imaicola (Asch. et Magn.) Hand.-Maz.
(*C. alpina* Clarke non Linn.)
An erect, glabrous or slightly pubescent herb; flowers white tinged with pink.
2745 m. Flowering and fruiting, flowers white, minute. Common. *Sharma & Badola* 928.

- Epilobium brevifolium* D. Don
A pubescent herb with purple pink flowers.
2745 m. Flowering and fruiting, flowers pink-purple. Frequent. *Sharma & Badola* 901.
- E. laxum* Royle
A herb with hairy stem.
3660 m. Fruiting. Common. *Sharma & Badola* 954.
- Oenothera rosea* Aiton
A small herb with purple flowers.
2895 m. Flowering and fruiting, flowers purple. Rare. *Sharma & Badola* 866.
- 3355 m. Fruiting. Occasional. *Sharma & Badola* 936.
- Selinum vaginatum* C.B. Clarke
A glabrous, perennial herb with white flowers.
3660 m. Flowering and fruiting. Frequent. *Sharma & Badola* 949.
- S. wallichianum* (DC.) Raizada & Saxena (*S. tenuifolium* Wall. ex DC.)
A glabrous perennial herb with white flowers.
3355 m. Fruiting. Frequent. *Sharma & Badola* 935.
- APIACEAE (UMBELLIFERAE)
- Bupleurum candolii* Wall. ex DC.
An erect glabrous herb with yellow flowers.
2290 m. Fruiting. Occasional. *Sharma & Badola* 998.
- B. falcatum* Linn.
An erect, glabrous herb with yellow flowers.
2590 m. Flowering and fruiting. Frequent. *Sharma & Badola* 833.
- B. wightianum* P. K. Mukerjee (*B. mucronatum* Wt.)
An erect herb with yellowish flowers.
3660 m. Fruiting. Common at this altitude. *Sharma & Badola* 962.
- Chaerophyllum villosum* Wall. ex DC.
A large herb with white flowers.
3355 m. Flowering and fruiting, flowers white. Occasional. *Sharma & Badola* 940.
- Pimpinella diversifolia* DC.
An erect hairy or pubescent herb with white flowers.
2590 m. Flowering and fruiting, flowers white. *Sharma & Badola* 821; 2895 m. Frequent. *Sharma & Badola* 865.
- Pleurospermum brunonis* Benth.
An erect herb with minute, purple flowers.
- ARALIACEAE
- Hedera nepalensis* K. Koch (*H. helix* auct non Linn.)
A large evergreen woody climber with yellowish green flowers.
2290 m. In buds and fruiting. Frequent on trees. *Sharma & Badola* 1014.
- CAPRIFOLIACEAE
- Lonicera myrtillus* var. *depressa* Rehder (*L. parvifolia* Edgew.)
A small, rigid nearly glabrous shrub with small white, pink tinged flowers, branches often prostrate.
3355 m. Vegetative. Occasional. *Sharma & Badola* 946.
- L. obovata* Royle ex Hook. f. & Thomson
A glabrous shrub; flowers white, fading to yellow.
2745 m. Vegetative. Frequent. *Sharma & Badola* 920.
- Viburnum cotinifolium* D. Don
A large deciduous shrub; flowers white or tinged with pink.
3050 m. Fruiting, fruits black. Frequent at this altitude. *Sharma & Badola* 858.

V. erubescens Wall.

A large shrub, or small tree with white flowers.

3510 m. Fruiting, mature fruits black. Frequent in oak forest to the end of tree line.

Sharma & Badola 948.

V. mullaha Buch.-Ham. ex D. Don (*V. stellulatum* Wall.)

An erect shrub or small tree with white flowers.

2810 m. Fruiting, fruits red. Frequent.

Sharma & Badola 890.

RUBIACEAE

Galium mollugo Linn. ssp. *asperifolium* (Wall.) Kitamura (*G. asperifolium* Wall.)

A perennial, slender herb with red flowers.

2590 m. Flowering and fruiting. Common.

Sharma & Badola 842.

Rubia manjith Roxb. ex Fleming (*R. cordifolia* L.)

A climbing perennial herb with small dark red flowers.

2895 m. Vegetative. Frequent.

Sharma & Badola 881.

VALERIANACEAE

Valeriana hardwickii Wall.

A pubescent annual herb with white flowers.

3355 m. Flowering and fruiting. Frequent.

Sharma & Badola 986.

DIPSACACEAE

Dipsacus mitis D. Don (*D. inermis* Wall.)

An erect herb with white or yellowish flowers.

2745 m. Flowering and fruiting, flowers white. Occasional.

Sharma & Badola 883.

Morina longifolia Wall. ex DC.

An erect, perennial herb with pink flowers.

2990 m. Flowering and fruiting, flowers white. Common at this altitude in open places. *Sharma & Badola* 860.

ASTERACEAE (COMPOSITAE)

Achillea millefolium Linn.

An erect, pubescent herb with white or pale pink flowers.

2745 m. Flowering, flowers white. Occasional.

Sharma & Badola 874.

Ainsliaea aptera DC.

An erect slender rather robust herb. Heads in interrupted spikes or spreading branched panicles, achenes obscurely ribbed.

2590 m. In buds. Common.

Sharma & Badola 819.

Anaphalis busua (Buch.-Ham.) Hand.-Mazz. (*A. araneosa* DC.)

An erect herb; heads sub-globose in sub-globose clusters or in large, open, much branched corymbs, invol. bracts elliptic, obtuse, white, opaque.

2590 m. Flowering, ray florets whitish, disc florets pale yellow.

Sharma & Badola 811.

A. contorta Hook. f.

An erect herb with white or yellowish heads.

2590 m. Flowering. Common.

Sharma & Badola 824.

A. margaritacea Benth. ex Hook. f. ssp. *angustior* Kitamura (*A. cinnamomea* C.B. Clarke)

An erect herb; heads subglobose, many invol. bracts, elliptic, ovate, obtuse, erect or incurved, white, opaque.

2590 m. Flowering. Leaves on lower surface woolly and white. Common.

Sharma & Badola 844.

A. royleana DC.

An erect herb; heads in rounded corymbs,

invol. bracts ovate, obtuse or acute, white.
3660 m. Flowering. Common. *Sharma & Badola* 983.

Artemisia nilagirica (Clarke) Pamp. (*A. vulgaris* auct non Linn.)

An erect tomentose, shrub like herb with dull white flowers.

3050 m. Fruiting. Common at this altitude in open places. *Sharma & Badola* 864; 3660 m. Fruiting. Lower surface of leaf silky white. Abundant at this altitude. *Sharma & Badola* 972.

A. roxburghiana Besser (*A. hypoleuca* Edgew.)

A shrub like herb with purple heads.

2590 m. Flowering. Leaves white silky on lower side. Occasional. *Sharma & Badola* 818.

Artemisia sp.

3050 m. Vegetative. Common at this altitude in open areas. *Sharma & Badola* 855.

Aster peduncularis Wall. ex Nees ssp. *peduncularis* (*A. asperulus* Nees)

An erect, branched, nearly glabrous herb with purple flower heads.

2590 m. Flowering, flowers bluish. Common. *Sharma & Badola* 804.

Carpesium pubescens Wall. ex DC. (*C. cernuum* Linn.)

An erect, branched, pubescent herb with yellow heads.

2745 m. Flowering. Frequent. *Sharma & Badola* 897.

Cicerbita macrorhiza (Royle) Beauv. var. *sexatilis* Beauv. (*Lactuca macrorhiza* Hook. f.)

A glabrous herb with grey blue heads.

3355 m. Flowering, flowers purple-violet. Procumbent herb, growing in moist places. Occasional. *Sharma & Badola* 982.

Cirsium wallichii DC. (*Cnicus wallichii* DC.)

An erect, pubescent herb with dull yellow heads.

2440 m. Fruiting. Frequent. *Sharma & Badola* 996.

Erigeron canadensis Linn.

An annual herb with numerous small yellow heads.

2290 m. Flowering. Occasional. *Sharma & Badola* 1024.

E. multiradiatus (Wall.) Benth. & Hook. f.

An erect hairy herb with dark purple heads. 2895 m. Flowering, ray florets violet, disc florets yellowish. Frequent. *Sharma & Badola* 876.

Myriactis wallichii Less.

An erect, pubescent herb with white ray-flowers and yellow disc-flowers turning dull purple in fruit.

2590 m. Flowering and fruiting, flowers pinkish. *Sharma & Badola* 841.

Prenanthes brunoniana Wall.

An erect herb with white or purple heads.

2590 m. Flowering. Frequent. *Sharma & Badola* 829; 2290 m. Flowering. Frequent. *Sharma & Badola* 1011.

P. violaeifolia Dcne.

An erect, glabrous herb with purple heads. 3510 m. Flowering, flowers blue. Frequent. *Sharma & Badola* 965.

Senecio chrysanthemoides DC.

An erect, herb, glabrous towards the base, pubescent upwards, heads bright yellow.

2745 m. Flowering, flowers yellow. Frequent. *Sharma & Badola* 929.

S. kunthianus Wall.

An erect herb. Leaves ash-white underneath. Heads yellow, involucre black.

3355 m. Flowering and fruiting, flowers yellow. Occasional. *Sharma & Badola* 963.

S. rufinervis DC.

A tall shrub like herb, branches, stem and inflorescence tomentose.

2590 m. Flowering, flowers yellow. Frequent.

Sharma & Badola 800.

Siegesbeckia orientalis Linn.

An erect herb, clothed with crisped hairs; heads yellow, sometimes white.

2745 m. Flowering and fruiting, flowers yellow. Occasional. *Sharma & Badola* 926.

Solidago virga-aurea Linn.

An erect, pubescent herb with yellow heads.

3050 m. Flowering, flowers yellow. Rare.

Sharma & Badola 857.

Tagetes minuta Linn.

An erect herb with pale yellow heads.

2135 m. Flowering. A few plants seen at this altitude. *Sharma & Badola* 1019.

Tanacetum longifolium Wall. ex DC.

An erect strong-scented hairy herb with bright yellow heads.

3660 m. Flowering, flowers yellow. Common at this altitude. *Sharma & Badola* 953.

Taraxacum officinale Weber

A perennial herb with milky juice with yellow heads.

2745 m. Flowering, flowers yellow. Common. *Sharma & Badola* 849; 3660 m. Common. *Sharma & Badola* 970.

Xanthium strumarium Linn.

An erect, coarse, rough herb.

2135 m. Flowering. A few plants seen at the spot. *Sharma & Badola* 1023.

CAMPANULACEAE

Campanula colorata Wall. (*C. ramulosa* Wall.)

A roughly hairy herb with pale lilac, purple or grey purple flowers.

2590 m. Flowering and fruiting, flowers violet. Plant hairy. *Sharma & Badola* 815.

Cyananthus lobatus Wall. ex Benth.

A small herb with dark blue flowers.

3660 m. Flowering and fruiting; flowers violet, calyx hairy, persistent. Common at this altitude. *Sharma & Badola* 971.

ERICACEAE

Rhododendron arboreum Smith

A tree with red or pink flowers.

2590 m. Vegetative. Occasional. *Sharma & Badola* 840.

R. lepidotum Wall.

An erect, aromatic shrub with dingy yellow or pale pink-purple flowers.

3355 m. Fruiting. Frequent at this altitude. *Sharma & Badola* 959.

PRIMULACEAE

Androsace lanuginosa Wall. ex Roxb.

A small herb, covered with silvery white silky hairs; flowers pale or dark-purple, tinged with blue, centre yellow.

2745 m. Vegetative. Common. *Sharma & Badola* 917.

OLEACEAE

Jasminum revolutum Sims. (*J. humile* Linn.)

An erect, glabrous shrub with yellow flowers.

2990 m. Fruiting. Frequent. *Sharma & Badola* 861.

ASCLEPIADACEAE

Cynanchum vincetoxicum (Linn.) Pers.

An erect, pubescent shrub with small yellow flowers.

2745 m. Fruiting. Occasional. *Sharma & Badola* 908.

GENTIANACEAE

Swertia cordata Wall. ex Clarke

An erect herb. Corolla yellow white, margins marked with short, pale purple streaks. 2745 m. Flowering and fruiting, flowers cream coloured, an orange gland present at the base of each petal. Occasional.

Sharma & Badola 851.

S. purpurascens Wall. ex Clarke

An erect herb, branches spreading. Corolla pale red-purple with a dark single complete ring at the base.

2745 m. Flowering, petals dark purple at base. Frequent. *Sharma & Badola 915.*

S. speciosa Wall. ex Griseb.

An erect herb with lurid grey flowers. 3355 m. Flowering and fruiting. Occasional. *Sharma & Badola 957.*

S. tetragona Edgew.

An erect herb with white flowers. 2440 m. Flowering, flowers white, petals not purple, at the base. Rare. *Sharma & Badola 989.*

BORAGINACEAE

Cynoglossum lanceolatum Forsk.

An erect herb; corolla pale blue or white. 2745 m. Flowering and fruiting, flowers deep violet. Frequent. *Sharma & Badola 900.*

C. microglochin Benth.

An erect, softly pubescent, herb with dark blue flowers. 3510 m. Fruiting, occasional, *Sharma & Badola 939B*; 3355 m. Flowering, flowers deep violet. Occasional. *Sharma & Badola 960.*

Hackelia uncinata (Royle ex Benth.) C.E.C. Fischer (*H. glochidiata* Brand.)

Herb, flowers blue with yellow centre.

3510 m. Fruiting. Occasional. *Sharma & Badola 939 A.*

SOLANACEAE

Datura stramonium Linn.

An annual, erect, nearly glabrous herb with white flowers.

2135 m. Flowering and fruiting. Occasional. *Sharma & Badola 987.*

SCROPHULARIACEAE

Mazus pumilus (Burm. f.) Steenis [*M. japonicus* (Thunb.) O. Kuntze; *M. rugosus* Lour.]

An erect, small, glabrous herb with pale blue or white flowers.

2135 m. Flowering and fruiting. Common. *Sharma & Badola 1025.*

Pedicularis brunoniana Wall. ex Pennell (*P. gracilis* Wall. ex Benth.)

An erect herb with pink purple flowers. 2745 m. Flowering and fruiting, flowers purple. Frequent. *Sharma & Badola 880*; 3660 m. Fruiting. Common. *Sharma & Badola 967.*

P. megalantha D. Don

An erect, pubescent herb with bright yellow flowers.

2620 m. Flowering and fruiting, flowers yellow. Frequent. *Sharma & Badola 853*; 3660 m. Fruiting. Common. *Sharma & Badola 938.*

Scrophularia calycina Benth.

A herb, glabrous or sparsely pubescent above; flowers greenish-purple or yellow. 3510 m. Fruiting. Frequent at this altitude. *Sharma & Badola 942.*

S. himalensis Royle ex Benth.

An erect herb with greenish flowers. 3355 m. Fruiting. Occasional. *Sharma & Badola 941*

Verbascum thapsus Linn.

An erect herb densely clothed with soft, yellow-grey, stellate hairs. Flowers yellow. 2895 m. Flowering and fruiting. Frequent. *Sharma & Badola* 875.

Wulfenia amherstiana (Wall.) Benth.

A nearly glabrous, perennial herb; flowers drooping, blue-purple varying to white. 2745 m. Fruiting. Common small herb. *Sharma & Badola* 907.

ACANTHACEAE

Pteracanthus alatus (Wall. ex Nees) Bremk. (*Strobilanthes alatus* Nees)

An erect pubescent shrub with dark blue flowers. 3050 m. Flowering and fruiting, flowers violet. Common at this altitude. *Sharma & Badola* 863.

LAMIACEAE (LABIATAE)

Clinopodium umbrosum (M.B.) C. Koch. (*Calamintha umbrosa* Benth.)

A softly hairy herb with pink or purple flowers. 2590 m. Flowering, flowers blue. Frequent. *Sharma & Badola* 843; 2745 m. Flowering and fruiting. Frequent. *Sharma & Badola* 911.

C. vulgare Linn. (*Calamintha clinopodium* Benth.)

A softly hairy herb with small pink or purple flowers. 2745 m. Flowering and fruiting, flowers bluish. Frequent. *Sharma & Badola* 910.

Elsholtzia patrinii (Lep.) Garcke. (*E. cristata* Willd.)

An erect, pubescent, fragrant herb with purple flowers. 2590 m. Flowering and fruiting, flowers white. Common. *Sharma & Badola* 826.

Lamium album Linn.

A decumbent or ascending, perennial herb with white or pale-pink flowers. 2290 m. Fruiting. Occasional. *Sharma & Badola* 1013.

Leonurus cardiaca Linn.

An erect, pubescent herb with pink flowers. 2745 m. Flowering and fruiting, flowers white, calyx persistent and spiny. Frequent. *Sharma & Badola* 872.

Nepeta ciliaris Benth.

A softly tomentose herb with lilac flowers. 2590 m. Flowering, flowers blue. Frequent. *Sharma & Badola* 991.

N. elliptica Royle ex Benth.

An erect herb with pale blue or nearly white flowers. 2745 m. Flowering, flowers bluish. Frequent. *Sharma & Badola* 899.

N. govaniana Benth.

A tall, erect, branched, finely hairy herb with yellow flowers. 3050 m. Flowering, flowers yellow. Common at this altitude. *Sharma & Badola* 862.

Origanum vulgare Linn.

An erect herb, clothed with short hairs; flowers pink. 2590 m. Flowering and fruiting. Frequent. *Sharma & Badola* 830.

Phlomis bracteosa Royle ex Benth.

An erect, hairy herb with dull blue-purple flowers. 2745 m. Flowering, flowers blue. Frequent. *Sharma & Badola* 913.

Plectranthus japonicus (Burm. f.) Koidz (*P. coetsa* Buch.-Ham. ex D. Don)

An erect, tall, pubescent undershrub with lavender blue flowers. 2590 m. Flowering, flowers purple. Frequent. *Sharma & Badola* 831.

P. rugosus Wall.

A stellately pubescent, herb; flowers white with rose or purple spots.

2135 m. Flowering, flowers white. Frequent at this altitude. *Sharma & Badola* 1018.

Prunella vulgaris Linn. (*Brunella vulgaris* Linn.)

A thinly hairy herb with violet purple flowers.

2745 m. Flowering, flowers violet. Frequent. *Sharma & Badola* 924.

Salvia nubicola Sweet (*S. glutinosa* Linn.)

An erect, perennial, viscidly hairy herb with yellow flowers, having upper lip purple dotted.

2590 m. Flowering, flowers pale yellow. Common. *Sharma & Badola* 823.

Stachys sericea Wall.

An erect herb, covered with long silky hairs; flowers pink, spotted with purple.

3050 m. Flowering, flowers pinkish. Frequent. *Sharma & Badola* 859; 3355 m. Flowering, flowers white or pinkish. Common upto 3660 m in open places. *Sharma & Badola* 961.

Thymus serpyllum Linn.

An aromatic, hairy more or less procumbent, often tufted shrub with small purple flowers.

2745 m. Flowering, flowers pink. Abundant in dry places. *Sharma & Badola* 916.

PLANTAGINACEAE

Plantago erosa Wall. (*P. major* Linn.)

A stemless, perennial herb with numerous green flowers.

2590 m. Fruiting. Common. *Sharma & Badola* 805.

AMARANTHACEAE

Achyranthes bidentata Blume

A straggling, hairy undershrub; spikes greenish, very slender.

2440 m. Fruiting. Frequent. *Sharma & Badola* 994.

Cyathula capitata Moq.

A sparsely hairy herb; heads white, glistening.

2590 m. Flowering. Frequent. *Sharma & Badola* 808.

CHENOPODIACEAE

Chenopodium album Linn.

An erect herb, flower-clusters in axillary spikes, often tinged with purple.

2590 m. Flowering. Frequent. *Sharma & Badola* 827.

C. botrys Linn.

A strongly aromatic, pubescent, glandular herb; flowers small, reddish.

2590 m. Fruiting. Occasional. *Sharma & Badola* 802.

POLYGONACEAE

Fagopyrum cymosum Meissn.

An erect, pubescent herb with white flowers.

2590 m. Flowering and fruiting, flowers white. Occasional. *Sharma & Badola* 835.

Polygonum alatum Buch.-Ham. ex D. Don

An erect herb with white or purple flowers.

2590 m. Flowering, flowers small, pink.

Common. *Sharma & Badola* 837.

P. amplexicaule D. Don var. *speciosa* Hook. f.

A nearly glabrous, erect herb; flowers pink or deep red, varying to white.

2745 m. Flowering, flowers red or white. Common. *Sharma & Badola* 879.

P. aviculare Linn.

A very variable, widely spreading, trailing twining plant; flowers small green, tipped with white or red.

2590 m. Flowering. Frequent. *Sharma & Badola* 788.

P. hydropiper Linn.

A 30-45 cm tall herb (prostrate at lower nodes) with pink or red flowers.

2590 m. Flowering. Rare. *Sharma & Badola* 990.

P. polystachyum Wall. ex Meissn.

An erect shrub; flowers white or tinged with pink.

2590 m. Flowering, flowers white. Frequent. *Sharma & Badola* 834.

P. recumbens Royle ex Bab.

A prostrate, rough herb with white or pink flowers.

2590 m. Flowering. Frequent. *Sharma & Badola* 787; 2990 m. Flowering. Procumbent herb. Occasional. *Sharma & Badola* 848.

Rumex nepalensis Spreng.

An erect herb; flowers small, green, often turning red.

2895 m. Fruiting. Common. *Sharma & Badola* 852.

BUXACEAE

Sarcococca saligna (Don) Muell.-Arg.

A handsome, evergreen, glabrous shrub with yellow flowers.

2745 m. Flowering. Frequent undershrub. *Sharma & Badola* 912.

CANNABINACEAE

Cannabis sativa Linn.

A tall erect annual herb with green flowers.

2590 m. Flowering and fruiting. Common. *Sharma & Badola* 789.

URTICACEAE

Girardinia leschenaultiana Decaisne (*G. heterophylla* Decn.)

An erect herb covered with stinging bristles; flowers small, green.

2440 m. Fruiting. Occasional. *Sharma & Badola* 1000.

Lecanthus wightii Wedd.

A succulent, pubescent herb with pink flowers.

2290 m. Flowering. Frequent-common along streams and in damp moist places at this altitude. *Sharma & Badola* 1008.

Parietaria debilis G. Forst.

A diffuse perennial herb; polygamous; male flowers few, female numerous.

2895 m. *Sharma & Badola* 867.

Pilea umbrosa Wedd.

An erect, hairy herb with minute, green flowers.

2290 m. Flowering. Common in damp places at this altitude. *Sharma & Badola* 1009.

Urtica parviflora Roxb.

An erect herb with green flowers.

2680 m. Flowering. Frequent. *Sharma & Badola* 854.

BETULACEAE

Betula utilis D. Don

Tree, bark smooth and paper like, peeling off in thin sheets; male spikes stipitate, female spike stout subsolitary, bracts pubescent.

3355 m. Vegetative. Frequent at this altitude. *Sharma & Badola* 984.

FAGACEAE

Quercus semecarpifolia Smith

A small or large, sub-evergreen, gregarious tree. Male spikes crowded, softly pubescent, female spikes short.

2745 m. Vegetative. Common. *Sharma & Badola* 925; 3510 m. Vegetative. Abundant, limiting the tree-line along with *Viburnum erubescens* Wall. *Sharma & Badola* 950.

SALICACEAE

Salix elegans Wall. ex Anders. (*S. kumaonensis* Lindl.)

A shrub or small tree, flowering after leafing. Catkins slender on leafy peduncles, bracts small yellow, male compact, fem. much larger, slender, drooping, bracts minute yellow subpubescent.

2745 m. Fruiting. Occasional. *Sharma & Badola* 888.

ORCHIDACEAE

Epipactis latifolia (Linn.) All.

An erect, terrestrial, leafy herb with dingy purple or green flowers.

2590 m. Fruiting. Frequent. *Sharma & Badola* 801.

Microstylis muscifera Ridley

A terrestrial herb with pale yellow-green flowers.

2745 m. Fruiting. Rare. *Sharma & Badola* 905.

IRIDACEAE

Iris sp.

3660 m. Vegetative. Common at this altitude. *Sharma & Badola* 973.

LILIACEAE

Polygonatum verticillatum Allioni

A herb with creeping root stock and drooping white-green or purple flowers.

3355 m. Vegetative. Occasional. *Sharma & Badola* 956; 3200 m. Fruiting. Occasional. *Sharma & Badola* 975.

SMILACACEAE

Smilax vaginata Decaisne

A densely branched, erect shrub with minute, purple flowers.

2745 m. Vegetative. Occasional. *Sharma & Badola* 904.

COMMELINACEAE

Commelina paludosa Blume

A slender herb with pale blue flowers.

2590 m. Flowering, flowers blue. Rare. *Sharma & Badola* 828.

ARACEAE

Arisaema helleborifolium Schott.

A tuberous herb with stems mottled with purple; spathe pale green, spadix protruding like a tail.

2290 m. Vegetative. Occasional. *Sharma & Badola* 988.

CYPERACEAE

Cyperus aristatus Rottb.

A small, annual herb with numerous, tufted, fibrous roots.

2745 m. *Sharma & Badola* 918A.

Kyllinga squamulata Vahl

A nearly glabrous herb, root fibrous, spikes 1-3, ovoid, nut brown.

2745 m. *Sharma & Badola* 918B.

POACEAE (GRAMINEAE)

Agrostis munroana Aitch. et Hemsl.

An annual erect grass with tufted stems, 15-45 cm tall.

3660 m. Flowering. Abundant. *Sharma & Badola* 968.

A. pilosula Trin. var. *royleana* (Trin.) Bor

An annual erect grass, 30-90 cm tall.

2590 m. Flowering. Frequent. *Sharma & Badola* 825.

Chrysopogon gryllus (Linn.) Trin.

A large coarse grass forming dense, hard tufts.

2590 m. Flowering. 60-90 cm high grass. Frequent. *Sharma & Badola* 838.

Dendrocalamus membranaceus Munro

Arborescent, unarmed.

2745 m. Vegetative. Common. *Sharma & Badola* 896.

Muehlenbergia huegelii Trin. (*M. viridissima* Nees ex Steud.)

Perennial grass, stems tufted, slender, ascending, creeping near the base; panicles drooping.

2590 m. Flowering. Frequent. *Sharma & Badola* 796; 2290 m. Flowering. Common. *Sharma & Badola* 1012.

Pennisetum flaccidum Griseb.

Perennial grass with stems decumbent and creeping near the base.

2590 m. Flowering. Frequent. *Sharma & Badola* 839.

Phacelurus speciosus (Steud.) C. E. Hubb.

[*Rottboellia speciosus* (Steud.) Hack.]

An erect perennial, robust, 30-120 cm tall.

2590 m. Flowering. Frequent, tall grass about 60-90 cm high. *Sharma & Badola* 803.

Stipa sibirica (Linn.) Lamk.

An erect, perennial with tufted smooth stems, 30-90 cm tall.

2590 m. Flowering. Frequent. *Sharma & Badola* 813.

GYMNOSPERMS

TAXACEAE

Taxus wallichiana Zucc. (*T. baccata* Linn.)

A small or rarely medium sized evergreen

tree; plants usually dioecious (male and female flowers rarely on the same tree).

2835 m. Fruiting. Frequent at higher altitude. *Sharma & Badola* 902.

PINACEAE

Abies pindrow Royle [*A. pindrow* (Royle) Spach.]

A large evergreen tree with a narrow cylindrical crown and very dark foliage; flowers monoecious.

2745 m. Vegetative. Common. *Sharma & Badola* 922.

Cedrus deodara (Roxb.) G. Don (*C. deodara* Loud.)

A large tree with greyish-brown bark and dark green, glaucous or silvery, sharply pointed leaves; cones barrel-shaped.

2590 m. Vegetative. Common. *Sharma & Badola* 798.

Picea smithiana (Wall.) Boiss.

A tall, evergreen tree of pendulous habit; flowers monoecious.

2590 m. *Sharma & Badola* 799.

Pinus wallichiana A. B. Jackson (*P. excelsa* Wall. ex Don)

A large tree.

2745 m. Vegetative. Common. *Sharma & Badola* 921.

PTERIDOPHYTES

HYMENOPHYLLACEAE

Mecodium polyanthos (Sw.) Copeland

2835 m. Vegetative. Leaves cream coloured. Occasional on tree trunks. *Sharma & Badola* 882.

PTERIDACEAE

Adiantum venustum D. Don

2895 m. Fertile. Common at places. *Shar-*

ma & *Badola* 878.

Coniogramme fraxinea (D. Don) Diels.
2290 m. Fertile. Occasional. *Sharma* & *Badola* 1010.

Onychium japonicum (Tnbg.) Kzl.
2745 m. Fertile. Common. *Sharma* & *Badola* 850; 2590 m. Fertile. Abundant at places. *Sharma* & *Badola* 993.

Pteridium aquilinum (L.) Kuhn.
2745 m. Vegetative. Frequent. *Sharma* & *Badola* 919.

ASPIDIACEAE

Dryopteris odontoloma (Moore) C. Chr.

2745 m. Vegetative. Frequent. *Sharma* & *Badola* 923.

Polystichum squarrosus (D. Don) Feé
2895 m. Fertile. Occasional. *Sharma* & *Badola* 868.

POLYPODIACEAE

Crypsinus malacodon (Hook.) Copeland
3050 m. Fertile. Common on moist rocks. *Sharma* & *Badola* 931.

Drynaris propinqua (Wall. ex Mett.) J. Sm.
2745 m. Fertile. Occasional on tree trunks. *Sharma* & *Badola* 914.